GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Surface Machining Technology, PG_00055509		
Field of study	Mechanical Engineering		
Date of commencement of studies	October 2021	Academic year of realisation of subject	2023/2024
Education level	first-cycle studies	Subject group	Optional subject group Subject group related to scientific research in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	3	Language of instruction	Polish
Semester of study	6	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Materials Engineering and Bonding -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Beata Majkowska-Marzec	
	Teachers		

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	15.0	0.0	0.0	30

E-learning hours included: 0.0

Technologia obróbki powierzchniowej, MiBM, TMiMK, Ist., sem.6 - Nowy - Moodle ID: 9344 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=9344

Learning activity and number of study hours

Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
Number of study hours	30	2.0	18.0	50

Subject objectives

The aim of the course is to familiarize students with technologies of manufacturing of surface layers and protective coatings and assessment of selected properties of the modified surface.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U09] is able to plan the manufacturing, assembly and quality control processes of typical constructions and mechanical devices, estimating their costs	The student is able to choose the production method and the type of protective coating or top layer in the context of the protection of the structure against external or operational factors.	[SU4] Assessment of ability to use methods and tools
[K6_W03] possesses and is able to practically apply the knowledge on the construction, properties and testing methods of construction materials	The student knows the most important trends in material engineering and is able to connect the acquired knowledge in the field of surface engineering with other fields of engineering knowledge.	[SW1] Assessment of factual knowledge

Subject contents

LECTURE Methods and techniques of forming surface layers. Chemical and electrolytic forming methods of the metallic coatings. Chosen production technology of the steel saturation by metallic and non-metallic elements. Creating of the coatings from gaseous phase and their applocation. Forming the surface layers by the laser, CVD, PVD and PLD treatments. LABORATORY Coatings fabricated by electrochemical method. Production technology of the immersed and sprayed coatings. Coatings created by thermo-chemical treatment. Advanced the surface layers.

Prerequisites and co-requisites

Knowledge of the subject: Fundamentals of Materials Engineering I and II

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Practical exercise	56.0%	40.0%
Written exam	56.0%	60.0%

Recommended reading

Basic literature

1. Burakowski T., Wierzchoń T.: Inżynieria powierzchni metali. WNT Warszawa 1995. 2. Praca zbiorowa pod redakcją Stanisława Tkaczyka.: Powłoki ochronne. Gliwice 1994. 3. Kula P.: Inżynieria warstwy wierzchniej. Wyd. Politechniki Łódzkiej, Łódź 2000. 4. Kusiński J.: Lasery i ich zastosowanie w inżynierii materiałowej. Kraków, Wyd. Naukowe Akapit 2000. 5. Klimpel A.: Napawanie i natryskiwanie cieplne. Technologie. WNT Warszawa 2000.

	Supplementary literature	1. Dobrzański L.A.: Podstawy nauki o materiałach i metaloznawstwo. Materiały inżynierskie i podstawy projektowania materiałowego. WNT. 2002.
	eResources addresses	
Example issues/ example questions/ tasks being completed	1. What is the difference between the protective coating and the top layer? 2. List the steps in the thermal spray process.	
Work placement	Not applicable	